United States Department of the Interior
Bureau of Land Management
Winnemucca Field Office July 2006

Environmental Assessment of the Proposed Upper and Lower Log Cabin Creek Solar Powered Water Projects in the Kings River Allotment

NV-020-06-EA-17

Prepared by:
U.S. Bureau of Land Management
Winnemucca Field Office
5100 East Winnemucca Blvd.
Winnemucca, NV 89445

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U.S. DEPARTMENT OF THE INTERIOR
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1.0 INTRODUCTION

Kings River Allotment is located in northern Humboldt County, Nevada with the northern boundaries of the allotment reaching just across the Nevada-Oregon state line. The Bilk Creek Mountains lie in the west portion of the allotment and the Trout Creek Mountains spread across the northern areas of the allotment.

In these mountainous areas of Kings River Allotment, issues associated with impacts from cattle grazing in Log Cabin Creek have been a concern for years. To reduce impacts and improve cattle distribution, the permittee for the Kings River Allotment, James Buell, is proposing the funding, construction and maintenance responsibilities to complete two solar powered water projects in the Log Cabin Creek watershed.

1.1 Purpose and Need

The season of cattle use in the Log Cabin Creek Pasture is generally during the summer months. Log Cabin Creek flows through the middle of the pasture and is used by the cattle as one of the main water sources. Cattle tend to concentrate and stay along the creek resulting in impacts that make it necessary to move the cattle to another pasture, or off the allotment, in a short period of time with very little utilization occurring in the uplands adjacent to the creek. The proposed Log Cabin Creek Solar Projects would provide water sources away from the creek for the cattle to better utilize the available upland forage and reduce the impacts associated with the numbers and amount of time cattle spend in the riparian habitats of Log Cabin Creek. The proposed additional water sources would improve cattle distribution and more uniform utilization of forage in the pasture would occur.

Materials for the proposed Upper and Lower Log Cabin Creek Solar powered water projects are currently on both private and Bureau of Land Management (BLM) land. The water troughs, pipelines and solar station on BLM land were temporarily authorized under a Categorical Exclusion (CX) for year 2003, but were not used. Currently, these materials are temporarily authorized to remain on BLM land to allow time for the projects to be analyzed for permanent use through an environmental assessment (EA). The water troughs, pipelines and solar station

will not be used unless the analysis determines that the projects are feasible on a permanent basis. If not, the materials on BLM land will be removed.

1.2 Land Use Conformance

The proposed action and alternative are in conformance with land use planning decisions presented in the *Paradise-Denio Management Framework Plan* (BLM 1982). The development of water sources is specifically addressed as a means to "increase existing allocatable livestock forage by artificial methods (RM 2.1)". In addition, the proposal is consistent with the objectives to:

- Provide an adequate quantity and quality of water sufficient to maintain livestock requirements (RM 1.10).

- Improve range administrative efficiency by improved allotment supervision methods (RM-3).

The proposal is also consistent with the decision to construct facilities in support of allotment forage allocations analyzed in the *Paradise-Denio Grazing Environmental Impact Statement* (BLM 1982b).

1.3 Issues

Based on input from BLM staff specialist, the following concerns relative to the proposed action have been identified:

- The spread of invasive, non-native plant species in the proposed project areas.

2.0 THE PROPOSED ACTION AND NO ACTION ALTERNATIVE

2.1 The Proposed Action

The proposed action is to complete the construction of two solar powered water projects in the Log Cabin Creek Pasture of the Kings River Allotment (Appendix A, map #1). The proposed projects would supply water for cattle to better utilize available forage in the uplands of Log Cabin Creek Pasture and reduce impacts to the riparian areas of Log Cabin Creek.

2.1.1 Upper Log Cabin Creek Solar Project

The main components of the proposed project, including the collection tank (cistern) and solar powered water pump, solar station with four collection panels, metal fence panels around the solar station, pipelines and two water troughs, are located on private land in T. 47 N., R. 32 E., Sections 21, 27 and 28. In the far southern portion of the project, two water troughs and the pipelines to the water

troughs are located on BLM public land in sections 27 and 28 (Appendix A, map #2).

The project's water source comes from a cistern in Log Cabin Creek approximately 2.8 miles downstream from Trident Peak Summit. The cistern is buried in the creek and perforated to collect water from the flow of the stream. 1 ¼ inch poly pipe is currently in place from the cistern to four water troughs located in the uplands. The pipe is laid on the ground surface and would not be buried. Water would be pumped from the cistern to the four water troughs with an electric pump powered by the solar station located near the cistern. When the project is in use, it would pump approximately 2 to 3 gallons a minute during daylight hours and have little effect on the flow of the stream. One water trough is located approximately 0.55 miles north of Log Cabin Creek The other three water troughs are located south of Log Cabin Creek, approximately 0.25, 0.38, and 0.50 miles from the creek

Total length of the pipelines would be approximately 1.4 miles with 1.1 miles on private land and 0.3 miles on BLM public land.

2.1.2 Lower Log Cabin Creek Solar Project

The proposed project would be located entirely on public lands in T. 47 N., R. 32 E., Sections 26, 27 and 35 (Appendix A, map #3). Materials currently in place include: a solar station and metal panels around the station, six water troughs and 1 ¼ inch poly pipe from the solar station to the water troughs.

The proposed water source for the project would come from a spring near Log Cabin Creek located approximately 1.5 miles downstream from the upper project and approximately 4.25 miles upstream from the Log Cabin Creek – Kings River junction.

The spring would be developed with a perforated, corrugated, culvert pipe placed in the spring as a head box to collect water. An approximate 250 ft. pipeline (1 ¼ poly pipe) would be installed, on the ground, from the spring head box to a storage tank located near the solar station. Water would gravity flow from the spring to the storage tank and the storage tank would be equipped with a float to shut off the flow of water once the tank is full. Water would be pumped from the storage tank by an electric pump through 1 ¼ inch poly pipe, already in place, to six water troughs located in the uplands away from the creek. Power to run the electric pump would come from the solar station. Two of the water troughs would be located approximately 0.27 and 0.33 miles north of Log Cabin Creek and the other four water troughs located from approximately 0.20 to 0.70 miles south of the creek. Total length of the pipelines would be approximately 1.6 miles.

A fence would be constructed around the area of the spring and immediate riparian area for protection from livestock. The fence would be built to BLM specifications for deer and antelope.

2.1.3 Features Common to All Projects

Permittee is responsible to comply with the water laws of the State of Nevada.

All the water troughs have built in bird ladders.

Water levels in the troughs would be controlled by floats.

Metal panels have been placed around the solar stations for protection from being damaged. The poly pipelines run on top the ground and were manufactured to withstand exposure to sunlight and trampling.

The proposed action would occur during the summer/fall of 2006. All projects would be implemented under Cooperative Agreements between the permittee, James Buell, and the Bureau of Land Management. The permittee would be responsible for annual maintenance of the projects and for monitoring the areas for the presence of noxious weeds. If weeds are identified, the permittee, in cooperation with the BLM, would treat the infestation with BLM approved herbicides.

2.2 The No Action Alternative

Under the no action alternative, the Upper and Lower Log Cabin Creek water developments would not be completed. The permittee would be required to remove all materials currently on BLM land associated with the Log Cabin Creek Solar water development projects.

Under the no action alternative: impacts associated with cattle concentrating in riparian areas of Log Cabin Creek would not be improved, livestock distribution would not be improved, a more uniform use of available forage would not occur in the Log Cabin Creek Pasture, and there would be no additional water sources in the uplands.

3.0 THE AFFECTED ENVIRONMENT

A variety of laws, regulations, executive orders, and policy directives mandate that the effects of a proposed action and alternative(s) on certain critical environmental elements be considered. Not all of the critical elements that require inclusion in this EA will be present, or if they are present, may not be affected by the proposed action and alternative (Table 1). Only those mandatory critical elements that are present and affected, or need to be considered, are described in this section.

In addition to the mandatory critical elements, there are additional resources that require impact analysis relative to the proposed action and alternative. These are presented in section **3.2 Additional Affected Resources.**

3.1 Critical Environmental Elements

The following critical elements of the human environment are present, or may be present, and affected by the proposed action and alternative: cultural resources; invasive, non-native species; migratory birds, water quality (surface and ground), and wetlands/riparian zones.

Lahontan cutthroat trout (LCT) are not present in the Log Cabin Creek watershed but the watershed has been listed by the 1995 Lahontan Cutthroat Trout (LCT) Recovery Plan as potentially capable of supporting LCT and are discussed in section *3.1.4 (Threatened and Endangered Species)*.

Table 1. Critical Environmental Elements

Critical Element	*Present*		*Affected*		*Rationale*
	Yes	No	Yes	No	
Air Quality	X			X	Only small amounts of fugitive dust would be created by the construction and use of the proposed water projects and fence.
ACEC's		X		X	No ACEC's are located in the area of the Proposed Action or No Action alternative.
Cultural Resources	X		X		See 3.1.1; 4.1.1; 5.3.1
Environmental Justice		X		X	Neither the Proposed Action nor the No Action alternative involves minority or low income populations.
Floodplains		X		X	No floodplains are located in the area of the Proposed Action or No Action alternative.
Invasive, Nonnative Species	X		X		See 3.1.2; 4.1.2; 5.3.2
Migratory Birds	X		X		See 3.1.3; 4.1.3; 5.3.3
Native American Religious Concerns		X		X	Available ethnographic data indicates that the Proposed Action and No Action alternative would not affect areas of Native American traditional or religious concern.
Prime or Unique Farmlands		X		X	No prime or unique farmlands are located in the area of the Proposed Action or No Action alternative.
Threatened and Endangered Species	X		X		See 3.1.4; 4.1.4 ; 5.3.4
Wastes, Hazardous or Solid		X		X	No hazardous or solid wastes are known to be located in the area of the Proposed Action or No Action alternative

Water Quality (Surface and Ground)	X		X		See 3.1.5; 4.1.5; 5.3.5
Wetlands and Riparian Zones	X		X		See 3.1.6; 4.1.6; 5.3.6
Wild and Scenic Rivers		X		X	No wild or scenic rivers are located in the area of the Proposed Action or No Action alternative.
Wilderness		X		X	No wilderness or wilderness study areas (WSA's) are in the area of the Proposed Action or No Action alternative.

3.1.1 Cultural Resources

Prehistoric and historic sites can be found throughout the region and in the project areas. Prehistoric sites range from as early as 12,000 years ago to as late as the mid-1800's when Euroamericans entered the area. Prehistoric sites include rock shelters, occupation sites (with probable buried deposits), temporary camps, lithic scatters, hunting blinds, rock art and quarry sites. Prehistoric sites are frequently found in association with permanent and intermittent water sources.

Historic sites may include various transportation and supply routes. The area may also include a number of historic campsites and features associated with various ranches, mines and other historic themes.

3.1.2 Invasive, Nonnative Species

Several laws authorize control of noxious weeds on public land under the BLM's administrative jurisdiction (e.g., The Federal Insecticide, Fungicide and Rodenticide Act of 1972, Federal Noxious Weed Act of 1974, FLPMA (1976), and the Public Rangelands Improvement Act of 1978).

Nevada Revised Status, Chapter 555.05 defines "noxious weeds" and mandates land owners and land management agencies to include control of noxious weeds on lands under their jurisdiction.

Nevada has listed 42 non-native invasive plant species that require control. Of these 42 species, 13 are found on the Winnemucca District (Table 2).

Table 2. Invasive, Non-Native Species found in the Winnemucca District.

Common Name	Scientific Name
Poison Hemlock	*Conium maculatum*
Russian Knapweed	*Acroptilon repens*
Spotted Knapweed	*Centaria maculosa*
Leafy Spurge	*Euphorbia elsua*
Medusahead	*Taeniatherum caput-medusae*
Tall White Top	*Lepedium latifolium*
Punctureveine	*Tribulus terrestris*
Salt Cedar (Tamarisk)	*Tamarix ramosissima*
Canada Thistle	*Circium arvense*
Musk Thistle	*Cardus nutans*
Scotch Thistle	*Onopordum acanthium*
Yellow Star Thistle	*Centaria solstitalis*
Hoary Cress	*Cardaria draba*

Weeds are spread from infested areas by people, equipment, animals and wind. When introduced to an area, these non-natives, invasive plant species can quickly dominate the landscape if management action is not initiated to control the infestations' expansion. Noxious weeds may proliferate, forming monocultures, which can crowd out other plants that provide biodiversity.

Scotch Thistle is known to exist in areas near the vicinities of the proposed projects. Other species from this table are also likely to be present in the larger region given the repeated occurrence of wildfire.

3.1.3 Migratory Birds

Migratory birds are protected and managed under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 *et. seq.*) and Executive Order 13186. Under the MBTA nests (nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed. Executive Order 13186 directs federal agencies to promote the conservation of migratory bird populations.

Migratory birds that may be associated with the project areas include: black-throated sparrow (*Amphispiza bilineata*), Brewer's blackbird (*Euphagus cyanocephalus*), Brewer's sparrow (*Spizella breweri*), burrowing owl (*Athene cunicularia*), canyon wren (*Catherpes mexicanus*), gray flycatcher (*Empidonax wrightii*), green-tailed towhee (*Pipilo chlorurus*), loggerhead shrike (*Lanius ludovicianus*), mountain bluebird (*Sialia currucoides),* mourning dove (*Zenaida macroura),* rock wren (*Salpinctes obsoletus*), sage sparrow (*Amphispiza belli*), sage thrasher (*Oreoscoptes montanus*), western meadowlark (*Sturnella neglecta*), and vesper sparrow (*Pooecetes gramineus*).

The burrowing owl, loggerhead shrike and vesper sparrow are BLM designated sensitive species.

3.1.4 Threatened and Endangered Species

Lahontan cutthroat trout (LCT) are federally listed threatened species. Though no known LCT currently exist in the Log Cabin Creek watershed, the 1995 Lahontan Cutthroat Trout (LCT) Recovery Plan identified the watershed as having habitat conditions potentially capable of supporting LCT. In the areas of the proposed projects, flow of water in Log Cabin Creek becomes extremely low in the late summer months making it difficult for fish populations to survive but may be able to support LCT on an intermittent basis during spring run-off when water volumes are higher. Further downstream from the projects, near its' junction with Kings River, Log Cabin Creek has a larger flow of water and may be able to support LCT on a more permanent basis.

3.1.5 Water Quality (Surface and Ground)

No water quality data is known for Log Cabin Creek or spring. The creek has not been determined to be an impaired watershed.

3.1.6 Wetlands/Riparian Zones

Riparian habitats associated with the proposed project include the riparian zones of Log Cabin Creek. Portions of the stream channel and banks of Log Cabin Creek were deeply incised from down cutting that occurred during heavy flooding in the mid 1980's. The lower project area burned in 1996 eliminating the mature riparian woody vegetation. This reach of Log Cabin Creek was assessed for riparian functionality in 1997; and was rated as non functional. Since the flooding and fire, herbaceous and woody plant species have filled in along the stream and banks helping to stabilize the system.

3.2 Additional Affected Resources

In addition to the critical elements, impacts to the following resources relative to the proposed action and alternative are described: fisheries, range, soils/vegetation, special status species, and wildlife. Those resources that are either not present or not affected by the proposed action or alternative are not presented.

3.2.1 Fisheries

The 1995 Lahontan Cutthroat Trout (LCT) Recovery Plan identified the Log Cabin Creek Watershed as having habitat conditions potentially capable of supporting LCT. LCT are discussed in section *3.1.4 (Threatened and Endangered Species).* Volume of stream flow in Log Cabin Creek becomes very low (trickle)

during the hot summer months and in 2004 stretches of the creek dried up just upstream from the proposed lower project. Due to these periods of extremely low volumes of water, trout fisheries would be intermittent with the fish migrating from Kings River and lower Log Cabin Creek during spring run-off when volumes of water are sufficient to support fish.

3.2.2 Range

The Kings River Allotment consists of approximately 145,930 public acres and 6,808 private acres. The allotment consists of twelve pastures used by cattle in a deferred-rotation management system. The proposed action would mainly affect the Log Cabin Creek Pasture within the allotment.

The Kings River Allotment grazing permit authorizes 12,192 Animal Unit Months (AUMs) for cattle to graze on the allotment from March 15 to November 30, each grazing year. The number of animal units for each grazing year is up to 1,480.

In riparian systems grazed by livestock, an average stubble height of no less than four inches on key herbaceous plant species, along the stream banks, is a widely accepted objective to maintain or improve riparian systems. Over each of the last three years (2003, 04 and 05), the permittee has needed to remove his cattle from Log Cabin Creek Pasture due to reaching an average stubble height of four inches within two to four weeks from cattle concentrating along Log Cabin Creek. Thus only a narrow corridor associated with riparian habitat in Log Cabin Creek is being utilized while much larger areas in the uplands, adjacent to the creek, receive very little use.

3.2.3 Soils/Vegetation

Soils information is extracted from the Soil Survey of Humboldt County, Nevada, East and West Parts, issued 2002 and 2003 consecutive. The proposed upper Log Cabin Creek project would be in soil map unit 1031/177 – Bullump-Sumine – Cleavage association and the proposed lower Log Cabin Creek project would be in soil map unit 1341 – Longcreek-Menbo – Rock outcrop association. The Bullump-Sumine – Cleavage association occurs in mountains and mountain back slopes; has deep and very deep, well drained soils; and surface soil textures mainly consisting of gravelly loam, very gravelly loam and cobbly loam. The Longcreek-Menbo-Rock outcrop association occurs on side slopes of mountains and mountain plateaus; has shallow, well drained soils; and surface soil texture mainly consisting of very cobbly loam and very gravelly loam. Within these soil map units, water erosion hazard is moderate and wind erosion hazard is slight.

Riparian vegetation along the stream and banks of Log Cabin Creek varies from stretches of densely covered woody species, with very little herbaceous understory, to more open areas and small meadows with a mixture of herbaceous

and scattered woody plant species. The main woody plants include: willows, alder, common chokecherry, elderberry, wild rose and currant. The main herbaceous plants include: rush, sedge, and bluegrass.

The main vegetation in the uplands of the upper proposed project includes: mountain big sagebrush, snowberry, bitterbrush, Thurber needlegrass, bluebunch wheatgrass, squirreltail and cheatgrass. The main vegetation in the uplands of the lower proposed project includes: cheatgrass, Thurber needlegrass, bluebunch wheatgrass, squirreltail and recovering mountain big sagebrush. Basin wildrye mixed with cheatgrass dominate the terraces along Log Cabin Creek.

3.2.4 Special Status Species

Sensitive species are taxa that are not already included as BLM Special Status Species under (1) Federally listed, proposed, or candidate species: or (2) State of Nevada listed species. BLM policy is to provide these species with the same level of protection as provided for candidate species in BLM Manual 6840.06C, that is to "ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed".

The Greater sage-grouse (*Centrocercus urophasianus*) has been designated a sensitive species by the BLM. According to the district sage-grouse habitat base, the projects would be located within the Lone Willow PMU (population management unit) summer, winter and nesting habitat for greater sage grouse. No known leks are located in the project areas with the nearest lek located approximately three miles southeast of the projects.

The pygmy rabbit has been designated a BLM sensitive species. In the great basin it's typically restricted to the sagebrush-grass complex. A dietary study of pygmy rabbits showed that they were dependent on sagebrush year round. Sagebrush was eaten throughout the year at 51% of the diet in summer and 99% in the winter. They also showed a preference for grasses and to lesser extent forbs, in the summer (Green and Flinders, 1980). These data seem to indicate that pygmy rabbits require sagebrush stands with an under story of perennial grasses to meet their seasonal dietary requirements. There has been no inventory for pygmy rabbits at the project site, so their presence there cannot be documented. However, since most of the area is dominated by big sagebrush, potential habitat for them exists.

"No on-the-ground field investigation was conducted for sensitive/protected plant, or animal species including birds. However, according to the Nevada Natural Heritage data base (January, 2006) and the Nevada Department of Wildlife Diversity data base (2005), no endangered, threatened, candidate or sensitive plants or animal species have been reported in the project area. However, the NDOW diversity data base did note one Vesper sparrow approximately 2 miles from the project area.

3.2.5 Wildlife

The project areas provide habitat for species common to the great-basin. Some of the large mammal species would include the black-tailed jackrabbit (*Lepus californicus*), coyote (*Canis latrans*), and badger (*Taxidea taxus*). Various small common mammals, primarily rodents, and common reptiles may also be found in the project areas.

The project areas fall within mule deer (*Odocoileus hemionus),* pronghorn antelope (*Antilocapra americana)* and bighorn sheep *(Ovis canadensis californiana)* habitat.

4.0 ENVIRONMENTAL CONSEQUENCES

This section of the EA presents an analysis of the direct, indirect, and cumulative impacts of the Proposed Action and No Action alternative on affected resources.

4.1 Direct and Indirect Impacts

4.1.1 Cultural Resources

Proposed Action

Since the pipelines would be placed on top of the ground, little or no disturbance to cultural resources is anticipated. The area around each trough was inspected. No cultural resources were found (CR2-1559).

No Action Alternative

Cultural resources would not be affected since the projects would not occur.

4.1.2 Invasive, Nonnative Species

Proposed Action

The proposed pipelines would be on the ground, and not buried, causing minimal ground and vegetation disturbance. Denuding of vegetation at the trough sites would increase the possibility of weed infestation. The trough sites would be monitored by the permittee for the presence of weeds (see 2.1.3, *Features Common to All Projects*). With monitoring for the presence of noxious weeds, the proposed action is not likely to result in the establishment and spread of invasive, nonnative species.

No Action Alternative

Under the no action alternative, the water troughs would be removed with little disturbance to soils and vegetation making it unlikely that invasive species would be introduced.

4.1.3 Migratory Birds

Proposed Action

The proposed Upper and Lower projects are mostly in place and a migratory bird survey would be done if construction to finish the projects were to occur during their peak breeding season (April 15 to July 15); thus minimal impacts are expected for migratory birds. Only a minor amount of habitat would be lost to construction activities and indirect impacts would include expected improvements to the riparian zone which is very important to migratory birds.

All water troughs for both proposed projects have built-in bird ladders specifically designed for birds to water and climb out.

No Action Alternative

No significant impacts would be expected to migratory birds under the No Action Alternative.

4.1.4 Threatened and Endangered Species

Proposed Action

One of the main objectives of the projects is to reduce cattle impacts in riparian areas of Log Cabin Creek which would improve riparian conditions and benefit LCT recovery efforts. No negative impacts are expected from the proposed action for LCT recovery plans.

No Action Alternative

Under the No Action Alternative, improving riparian conditions that would benefit the LCT recovery plan would not occur.

4.1.5 Water Quality (Surface and Ground)

Proposed Action

No impacts to ground water are anticipated. Water quality for the creek should be improved as the cattle would drink more from the troughs in the uplands and less from the creek.

No Action Alternative

No change to water quality is expected under the No Action Alternative.

4.1.6 Wetlands and Riparian Zones

Proposed Action

The materials for the proposed Upper Log Cabin Creek Solar project have been in place since 2003 and no negative impacts to the riparian zone have been observed or are expected. The pipelines to the water troughs lay on top the ground and are partially covered with vegetation. The cistern was buried in the creek with rocks and appears stable. Erosion around the cistern from the flowing stream could be a problem over time. The permittee plans on inspecting the project on a regular basis to fix any erosion problems that may develop.

Most of the materials for the proposed Lower Log Cabin Creek Solar Project, including the solar station, metal fence panels protecting the station, above ground pipelines and six water troughs, have been in place since 2003 and no negative impacts to riparian habitat have been observed or are anticipated. Placing the culvert pipe in the spring would muddy the spring for a short period of time. The amount of water piped from the spring would be controlled by a float in the storage tank so only the amount of water used from the troughs would be taken from the spring. The small percentage of water that would be used from the spring should not affect the condition of the spring. The spring area would be fenced for protection from cattle trampling and hoof action which would maintain or improve its' condition.

The additional water sources proposed in the Log Cabin Creek Solar Projects would increase the amount of time cattle spend in the uplands and decrease the time they spend in the riparian zones. Decreasing the time livestock spend in riparian habitat would reduce impacts to maintain or improve the system.

No Action Alternative

Under the No Action Alternative, reducing cattle impacts in Log Cabin Creek riparian habitat would not occur.

4.1.7 Fisheries

Proposed Action

The Upper Log Cabin Creek Solar Project would pump approximately 2 to 3 gallons of water a minute during daylight hours and is not expected to adversely affect the flow of the stream. The water source for the Lower Log Cabin Creek Solar Project would come from a nearby spring that flows into the creek. The

small percentage of water taken from the spring would have minimal impact on the spring and flow of water in the creek.

Improving the current riparian conditions may benefit fisheries.

No Action Alternative

No significant impacts to fisheries are anticipated from the No Action Alternative.

4.1.8 Range

Proposed Action

Persistent riding efforts, by the permittee, have had some success in keeping cattle pushed out of the Log Cabin Creek riparian areas, but without water sources in the adjacent uplands, the cattle continually return to water and hang-out along the creek. Riding efforts, with the addition of the proposed water troughs, would help hold the cattle in the uplands and reduce the time cattle spend in riparian habitats. With cattle watering and spending more time in the uplands: cattle distribution would be improved, there would be more uniform use of available forage, the four inch minimum stubble height utilization objective would be met over a longer period of time, and Log Cabin Creek riparian habitat conditions would be improved.

No Action Alternative

Under the No Action Alternative, the water troughs would be removed and no additional water sources would be available in the uplands of Log Cabin Creek Pasture. Cattle would continue to concentrate in the riparian zones of Log Cabin Creek, more uniform use of available forage would not occur and cattle distribution would not be improved.

4.1.9 Soils/Vegetation

Proposed Action

The implementation of the Log Cabin Creek Solar projects would have little impact to soils and vegetation as most of the materials are currently in place. The main impacts would be cattle watering at the proposed water troughs. In the areas of the water troughs, hoof action from the cattle would compact the soils and vegetation would probably not rejuvenate in these immediate areas. Areas of compaction around the water troughs would be relatively small; therefore, impacts to soils and vegetation from installation and use of the pipelines and water troughs would be minor.

The Proposed Action would have a longer-term beneficial impact by improving riparian vegetation conditions that would help to better stabilize the soils.

No Action Alternative

Vegetation and soil conditions would not be improved in riparian areas of Log Cabin Creek.

4.1.10 Special Status Species

Proposed Action

There may be minimal impacts to habitat since grazing in the uplands would increase, but use would be limited to the same number of permitted cattle. The subject impacts should be offset from the expected improvements to the riparian area which is important for sage-grouse brood-rearing and summer habitat.

The proposed projects would be in greater sage grouse habitat. No particular impacts to sage grouse are anticipated. The nearest known lek to the proposed Log Cabin Creek solar powered water projects is approximately three miles southeast of the projects. The water troughs have built in bird ladders for the birds to climb out.

The other BLM designated sensitive species cited in section *3.1*.3 *(Migratory Birds)* include the burrowing owl, loggerhead shrike and vesper sparrow. Though these bird species have not been reported in the proposed project areas, habitat conditions exist where they could occur. Due to the short period of time needed to complete the projects, potential impact to these designated sensitive species are expected to be minimal.

Improvements to the riparian area are expected which should benefit special status species.

No Action Alternative

Impacts to special status species would be expected to remain as they have been under the No Action Alternative.

4.1.11 Wildlife

Proposed Action

Completing the solar powered water projects would have minimal impacts to wildlife as work to complete the projects would be for a short period of time. The areas of disturbance would be relatively small and not impact the forage available

to wildlife. The proposed water troughs could benefit wildlife by increasing the availability of water.

The riparian area is important to mule deer and the increase in upland utilization should be offset by the expected improvement in the riparian area. Also, the increased availability of water may allow wildlife to better use available habitat.

No Action Alternative

Under the No Action alternative, wildlife would not benefit from the additional water sources.

5.0 CUMULATIVE IMPACTS

The Council on Environmental Quality (CEQ) regulations that implement NEPA define a cumulative impact as: "The impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

The cumulative impact assessment area for this EA is the Log Cabin Creek watershed (USDA 2006; Appendix B). The area consists of approximately 37,272 acres of which about 31,267 acres are public land, 4,175 acres are private lands, and about 1,830 acres are located in Harney County, Oregon. The area is bounded on the north by the Trout Creek Mountains and on the south by the northern end of King's River Valley and the Bilk Creek Mountains.

5.1 Past and Present Actions

On the basis of aerial photographic data, agency records and GIS analysis, the following past and present actions, which have impacted the assessment area to varying degrees, have been identified: livestock grazing, road development, and wildfire.

Livestock Grazing – Livestock grazing has a long history in the region dating back to the late 1800's. Today, it remains the dominant use of the cumulative impact assessment area. Throughout its' history, ranching has remained a dispersed activity characterized by localized areas of more intensive use.

The assessment area is located within the King's River allotment. Livestock are rotated through the various allotment pastures under a deferred rotation management system. Non-federally managed grazing has also occurred on private lands in the southeastern part of the assessment area.

In order to improve management of the allotments, a variety of range improvement projects have been implemented through the years. Collectively, 4 springs have been developed and 41 miles of permanent fencing (both public and private), 0.8 miles of water pipeline, three reservoirs, 3 corrals, and one cattle guard have been constructed in support of grazing management objectives in the assessment area (BLM 2006a; 2006b).

Road Development - At the present time, there are about 42 miles of roads of varying types in the area. About 10 miles of road are part of the BLM system, while the balance are unimproved dirt roads or two-tracks (BLM 2006c).

Unimproved roads account for approximately 77 percent of the total length and 72 percent of total area of roads in the sub watershed (Table 3). Most of these roads have their origin in ranching access and only a few are regularly maintained.

Table 3. Roads in the Cumulative Impact Assessment Area.

Road	*Total length (miles)*	*Estimated width (feet)*	*Estimated Area (acres)*
BLM System	9.56	20	23.2
Unimproved	32.12	15	58.4
Total	*41.68*	*35*	*81.6*

Wildfire – Although not a past or present action per se, the repeated occurrence of wildfire has altered the vegetation of much of the assessment area. Between 1988 and 1997, four separate wildfires have burned approximately 15,681 acres or about 42 percent of the assessment area (BLM 2006d). Most of the affected areas have been subjected to a variety of stabilization and rehabilitation treatments with mixed results.

5.2 Reasonably Foreseeable Future Actions (RFFA's)

All of the past and present actions discussed above are expected to persist into the foreseeable future, though the relative intensity of these actions could vary depending on a variety of economic and other factors.

Livestock Grazing - The intensity and character of livestock grazing is anticipated to remain consistent into the foreseeable future. At the current time, there are no proposals to change stocking levels or seasons of use of any of the allotments represented in the assessment area. It is reasonably foreseeable, however, that small-scale range improvements, such as exclosures, troughs, water pipelines, or fences could be proposed in support of allotment-specific objectives.

Roads and Infrastructural Development - At present, there are no known proposals to construct, alter, or improve roads within the assessment area. Reasonably foreseeable future actions associated within roads are likely to be limited to grading or other maintenance of road surfaces and the management of existing fuel brakes through the application of mechanical or chemical treatments.

Wildfire – While the occurrence of wildfire is unpredictable, it is likely, based on historical patterns, that wildfire will again burn parts of the assessment area. BLM fire management policy states that wildfire will be aggressively suppressed, which makes it likely that suppression techniques such as the construction of dozer lines, the cross-country travel of engines, the implementation of retardant drops, and the establishment of base camps for fire fighters are reasonably foreseeable.

Depending on the severity of the fire, and the nature of topography and soils, it is also reasonably foreseeable that some combination of rehabilitation and stabilization treatments such as dozer line stabilization, road repair, the construction of erosion or sediment control structures, the repair of damaged range improvements and facilities, drill and/or aerial seeding, range closures, greenstripping and nonnative weed control would be implemented.

The following sections discuss the cumulative impacts of the Proposed Action and No Action alternative when combined with past, present, and reasonably foreseeable future activities within the cumulative impact assessment area.

5.3 Impacts Associated with Past, Present, and Reasonably Foreseeable Future Actions

Impacts associated with past, present, and reasonably foreseeable future actions are generally created by ground or vegetation-disturbing activities that effect natural and cultural resources in various ways. Of particular concern is the *accumulation* of these impacts over time. This section of the EA considers the degree to which the Proposed Action and No Action contribute to the collective impact.

5.3.1 Cultural Resources

Impacts from Past and Present Actions
Cattle trampling and trailing have impacted resources in localized areas.

Impacts from RFFAs
Livestock grazing will continue to impact resources in localized areas. Future, new impacts on public land will be avoided or mitigated through compliance with the National Historic Preservation Act.

Impacts from the Proposed Action and No Action Alternative
The results of a Class III cultural resource inventory indicate that the Proposed Action would have negligible impacts on cultural resources.

Under the No Action Alternative, there would be no impacts to cultural resources.

Cumulative Impact
The cumulative impact is considered minor.

5.3.2 Invasive, Nonnative Species

Impacts from Past and Present Actions
Past and present livestock grazing and wildfires have contributed to the spread of noxious weeds.

Impacts from RFFA's
Grazing will continue to promote the spread of certain weed species, though increased treatment efforts will lead to better control.

Impacts from the Proposed Action and No Action Alternative
No impact would occur from the Proposed Action if monitoring and mitigation measures are implemented.

Impacts would not change under the No Action Alternative.

Cumulative Impact
Increases in the proliferation of invasive, nonnative species will occur if inventories are not completed and identified infestations promptly treated.

Currently the cumulative impact is considered moderate.

5.3.3 Migratory Birds

Impacts from Past and Present Actions
Minor amounts of displacement have resulted from disturbances to habitat associated with grazing and construction of roads.

Wildfires have destroyed large areas of native habitat.

Impacts from RFFA's
Impacts from livestock grazing should not increase if utilization objectives are met. The main concern is wildfire causing the loss of habitat.

Impacts from the Proposed Action and No Action Alternative
There should be little impact from the Proposed Action as very little disturbance would occur to complete the projects. Very minor, if any, impacts are expected to affect migratory birds.

The No Action alternative would not change impacts to migratory birds.

Cumulative Impact
The cumulative effect is considered minor.

5.3.4 Threatened and Endangered Species

Impacts from Past and Present Actions
Lahontan Cutthroat Trout (LCT) are not currently in the Log Cabin Creek Watershed, and there is no known documentation of LCT being in the watershed within the recent past, but were considered in this EA because the watershed is designated as potential habitat for the trout.

Impacts from RFFA's
Impacts from cattle and roadways are expected to be minor for LCT recovery efforts.

The possibility exists that in the reasonably foreseeable future, wildfires could destroy from small to large percentages of riparian habitat needed for LCT recovery efforts.

Impacts from the Proposed Action and No Action Alternative
Impacts from the Proposed Action are not expected to be negative and may be positive by improving riparian conditions.

The No Action Alternative would not improve riparian conditions.

Cumulative Impact
Cumulative impacts are considered minor unless wildfires destroy large areas of riparian habitat.

5.3.5 Water Quality (Surface and Ground)

Impacts from Past and Present Actions
Punching and trampling from livestock in springs and along streams has impacted water quality.

Fire rehabilitation activities have led to minor sedimentation impacts to water quality.

Impacts from RFFA's
Future grazing could affect water quality via trampling and punching in and along springs and creeks.

Future fire rehabilitation activities would be expected to lead to minor sedimentation impacts.

Impacts from the Proposed Action and No Action Alternative
Impacts from the Proposed Action are expected to be minor and may improve water quality in Log Cabin Creek if time cattle spend along the creek is reduced.

Under the No Action alternative, impacts would remain the same as they have in the past.

Cumulative Impact
The cumulative effect is considered minor to moderate.

5.3.6 Wetlands and Riparian Zones

Impacts from Past and Present Actions
Past grazing activities have impacted streams and springs from trampling and hoof action.

Wildfires have destroyed deep rooted vegetation making stream channels vulnerable to erosion.

Impacts from RFFA's
Future grazing could affect riparian zones via trampling and punching around springs and streams.

Wildfires will likely continue to destroy riparian habitats.

Impacts from the Proposed Action and No Action Alternative
The Proposed Action would have minor effect and may improve riparian areas in Log Cabin Creek by reducing the amount of time cattle spend along the creek.

Under the No Action alternative, impacts would continue as they have in the past.

Cumulative Impact
The cumulative effect is considered minor.

5.3.7 Fisheries

Impacts from Past and Present Actions
Past and present actions have had minor impact on fisheries. Mudding the creeks may have impacted fisheries on occasions.

Impacts from RFFA's
Future grazing should have minor impacts to fisheries under current grazing regulations.

Impacts from the Proposed Action and No Action Alternative
The Proposed Action is not expected to have negative impacts to fisheries.

Under the No Action alternative, impacts would continue as they have in the past and present.

Cumulative Impact
The cumulative impact is expected to be minor.

5.3.8 Range

Impacts from Past and Present Actions
Past actions have resulted in some displacement of livestock and adjustments in livestock management.

Impacts from RFFA's
Impacts are expected to remain as they have in the past.

Impacts from the Proposed Action and No Action Alternative
The Proposed Action should help livestock management by improving livestock distribution.

Under the No Action Alternative, additional upland water sources would not be available to improve livestock distribution.

Cumulative Impact
The cumulative impact is considered minor.

5.3.9 Soils and Vegetation

Impacts from Past and Present Actions
Livestock grazing and construction of roads have damaged and destroyed some natural vegetative communities rendering some soils susceptible to wind and water erosion.

Wildfires have burned a substantial amount of natural vegetation within the assessment area. In these areas natural vegetation has been replaced by invasive annual grasses and weeds.

Impacts from RFFA's
Adherence to the Standards for Rangeland Health should limit impacts to vegetative communities and soils from grazing.

Wildfires will likely continue to destroy native vegetation in portions of the assessment area.

Impacts from the Proposed Action and No Action Alternative
Cattle would denude vegetation in the immediate areas around the water troughs. The impact is considered minor.

Under the No Action alternative, distribution of livestock would not improve and more uniform use of forage species would not occur.

Impacts would remain as they have under the No Action Alternative.

Cumulative Impact
The collective impact is considered minor to moderate.

The primary impact to vegetation in the assessment area is from wildfire which has resulted in proliferation of cheat grass monocultures.

5.3.10 *Special Status Species*

Impacts from Past and Present Actions
Grazing and road construction activity has resulted in minor displacement.

Wildfires have degraded large areas of native habitat where special status species could occur.

Impacts from RFFA's
Impacts from future livestock grazing is considered minor.

Wildfires will likely continue to degrade portions of the native habitat.

Impacts from the Proposed Action and No Action Alternative
The Proposed Action is not expected to have negative impacts to Special Status Species.

The No Action alternative would not change impacts to Special Status Species.

Cumulative Impact
The likely cumulative effect is considered minor.

5.3.11 Wildlife

Impacts from Past and Present Actions
Past grazing and road development have resulted in minor habitat degradation and displacement.

Wildlife habitat has been substantially impacted by wildfire which has led to the proliferation of invasive annual grasses and weeds.

Impacts from RFFA's
Enforcement of grazing regulations and adherence to the Standards for Rangeland Health should reduce and mitigate most future impacts to wildlife habitat on public land.

Impacts from the Proposed Action and No Action Alternative
Impacts associated with the Proposed Action would be minimal due to the limited scope of the projects and the proposed methods of construction.

No additional water sources would be available to wildlife under the No Action alternative.

Cumulative Impact
The cumulative impact is considered minor.

6.0 PROPOSED MITIGATION MEASURES AND MONITORING

Appropriate mitigation measures have been proposed in section **2.1 The Proposed Action** and no additional mitigation is proposed based on the results of the respective impact analyses.

The BLM would be responsible for monitoring the construction and maintenance of the facilities proposed under the Proposed Action.

The permittee is responsible for complying with other applicable state, federal, or local laws and obtaining the necessary permits.

7.0 CONSULTATION AND COORDINATION

7.1 Interested Publics

The following interested publics will be sent this document via mail. These publics will be afforded a 30 day comment period.

Western Watershed Project
Humboldt County Commissioner
FNAWS
NRCS
Department of Administration
NDOW Winnemucca
NDOW Fallon
Nevada Cattlemen's Association
Nevada Wool Growers
Leo and Donna Harrer
US Fish and Wildlife Service
Public Land Solutions

7.2 Internal Review

The following staff participated in the writing or review of this EA:

Scott Clarke	Rangeland Management Specialist/Project Lead
Regina Smith	Cultural Resources/Native American Religious Concerns
Derek Messmer	Noxious Weeds/Invasive Species
Ken Detweiler	Special Species Status/Migratory Birds/Wildlife
Mike Zielinski	Vegetation/Soil/Riparian
Amanda DeForest	Supervisory Rangeland Management Specialist
Chuck Schlarb	Civil Engineering Technician
Greg Lynch	Fisheries
Mark Ennes	Cumulative Impact Assessment Development
Lynn Harrison	Planning and Environmental Coordinator

8.0 REFERENCES

Bureau of Land Management

1982a *Paradise-Denio Management Framework Plan*. MFP on file, Winnemucca Field Office.

1982b *Paradise-Denio Grazing Environmental Impact Statement*. EIS on file, Winnemucca Field Office.

2006a Range Improvement Lines. Current GIS layer. Winnemucca Field Office.

2006b Range Improvement Points. Current GIS layer. Winnemucca Field Office.

2006c Roads. Current GIS layer. Winnemucca Field Office.

2006d Fire History. Current GIS layer, Winnemucca Field Office.

Green, J.S. and J.T. Flinders. 1980. Habitat and dietary relationships of the pygmy rabbit. Journal of Range Management. 33:136-142.

United States Department of Agriculture

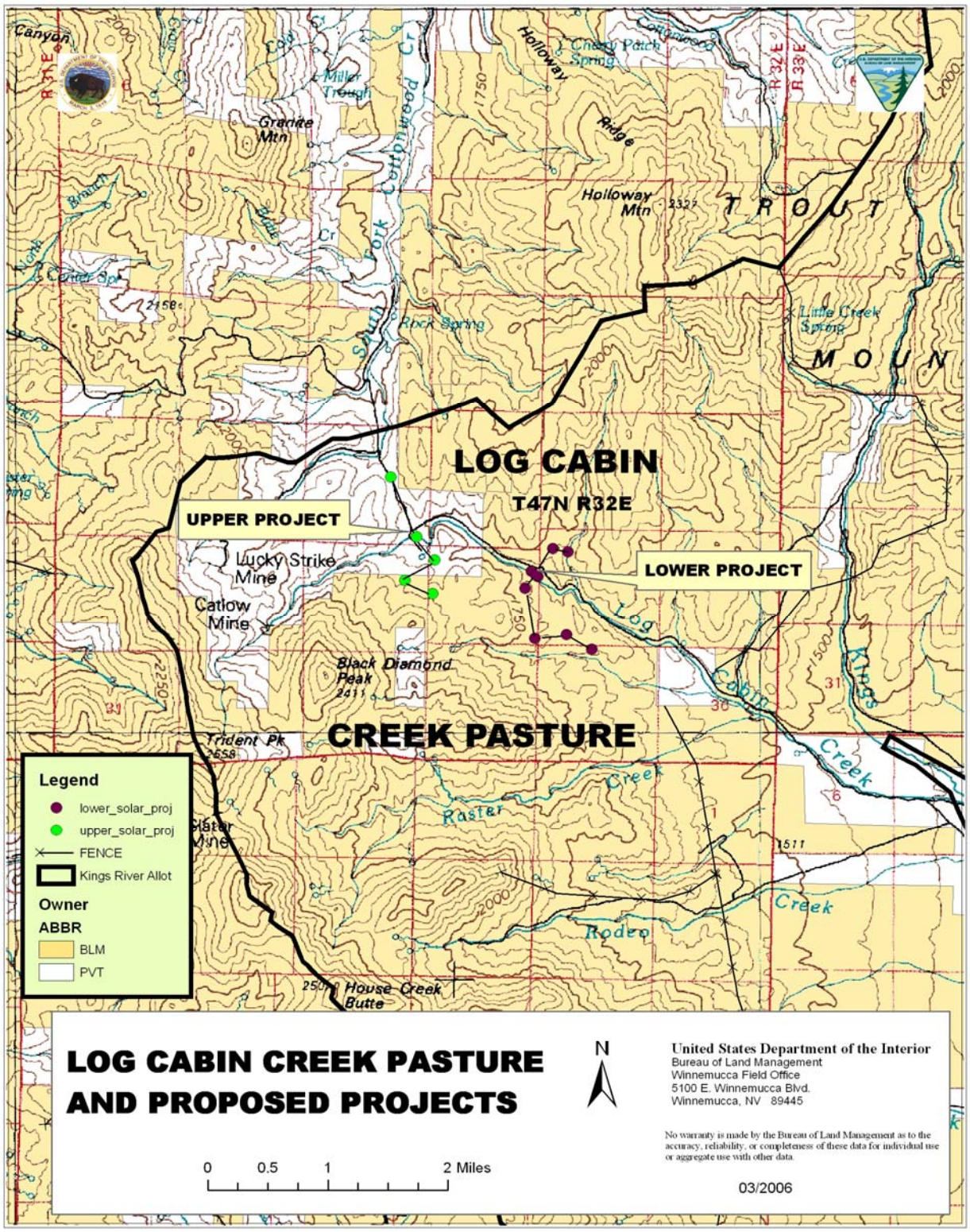
2002 *Survey of Humboldt County, Nevada, East Part, Part I*. United States Department of Agriculture.

2006 *Hydrologic Unit Coverage 5*. Draft GIS layer. Natural Resources Conservation Service.

APPENDIX A

MAPS OF THE PROPOSED PROJECTS

MAP #1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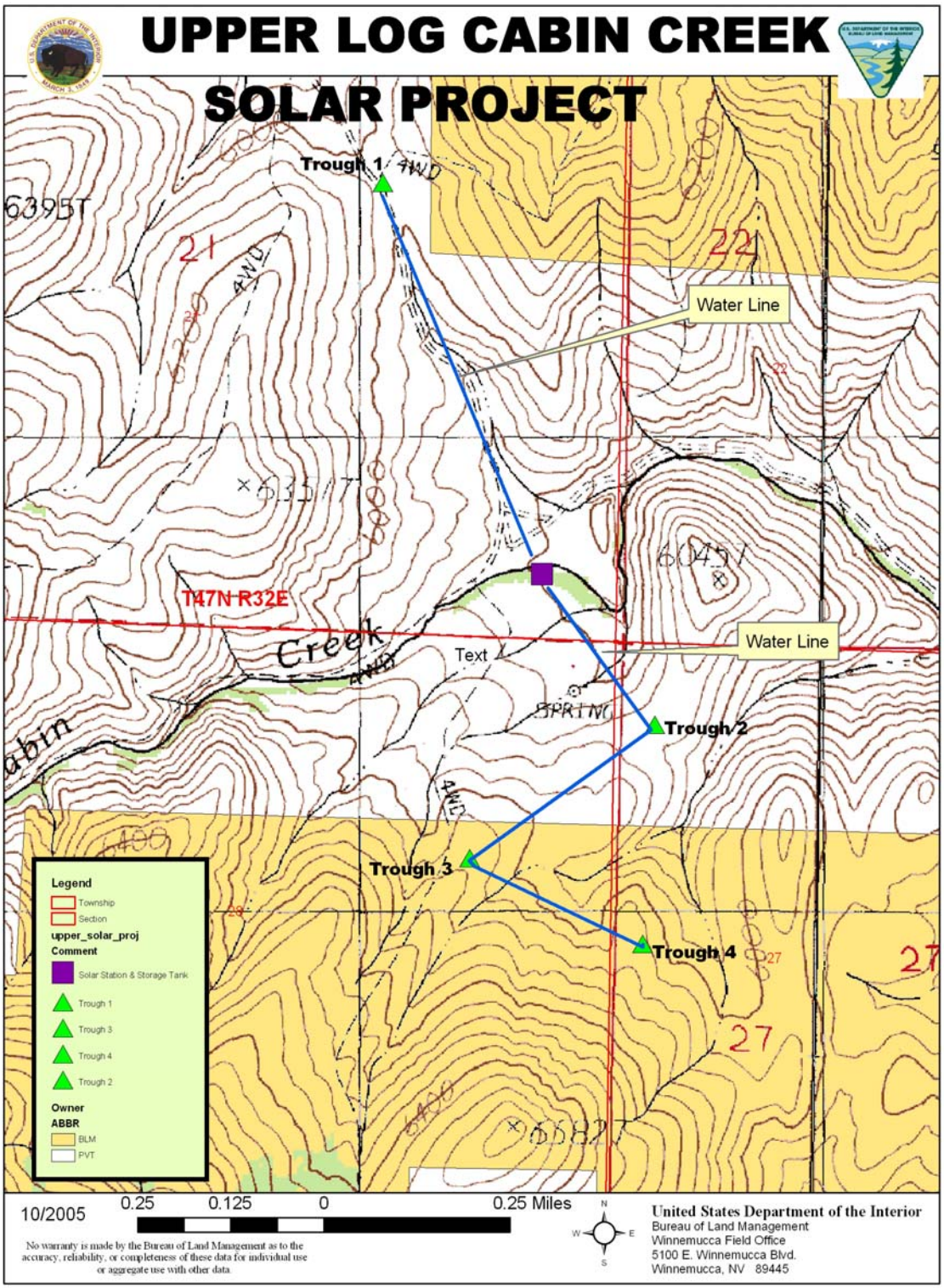
T47N R32E
UPPER PROJECT
LOWER PROJECT
CREEK PASTURE
Lucky Strike Mine
Catlow Mine
Black Diamond Peak
Trident Pk
House Creek Butte
Granite Mtn
Holloway Mtn
Miller Trough
Cherry Patch Spring
Little Creek Spring
Log Cabin Creek
Raster Creek
Rodeo Creek
Legend
lower_solar_proj
upper_solar_proj
FENCE
Kings River Allot
Owner
ABBR
BLM
PVT
LOG CABIN CREEK PASTURE AND PROPOSED PROJECTS
N
United States Department of the Interior
Bureau of Land Management
Winnemucca Field Office
5100 E. Winnemucca Blvd.
Winnemucca, NV 89445
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.
03/2006
0 0.5 1 2 Miles

MAP #2


UPPER LOG CABIN CREEK
SOLAR PROJECT
Trough 1
Water Line
Water Line
T47N R32E
Text
Trough 2
Trough 3
Trough 4
Legend
Township
Section
upper_solar_proj
Comment
Solar Station & Storage Tank
Trough 1
Trough 3
Trough 4
Trough 2
Owner
ABBR
BLM
PVT
10/2005
0.25
0.125
0
0.25 Miles
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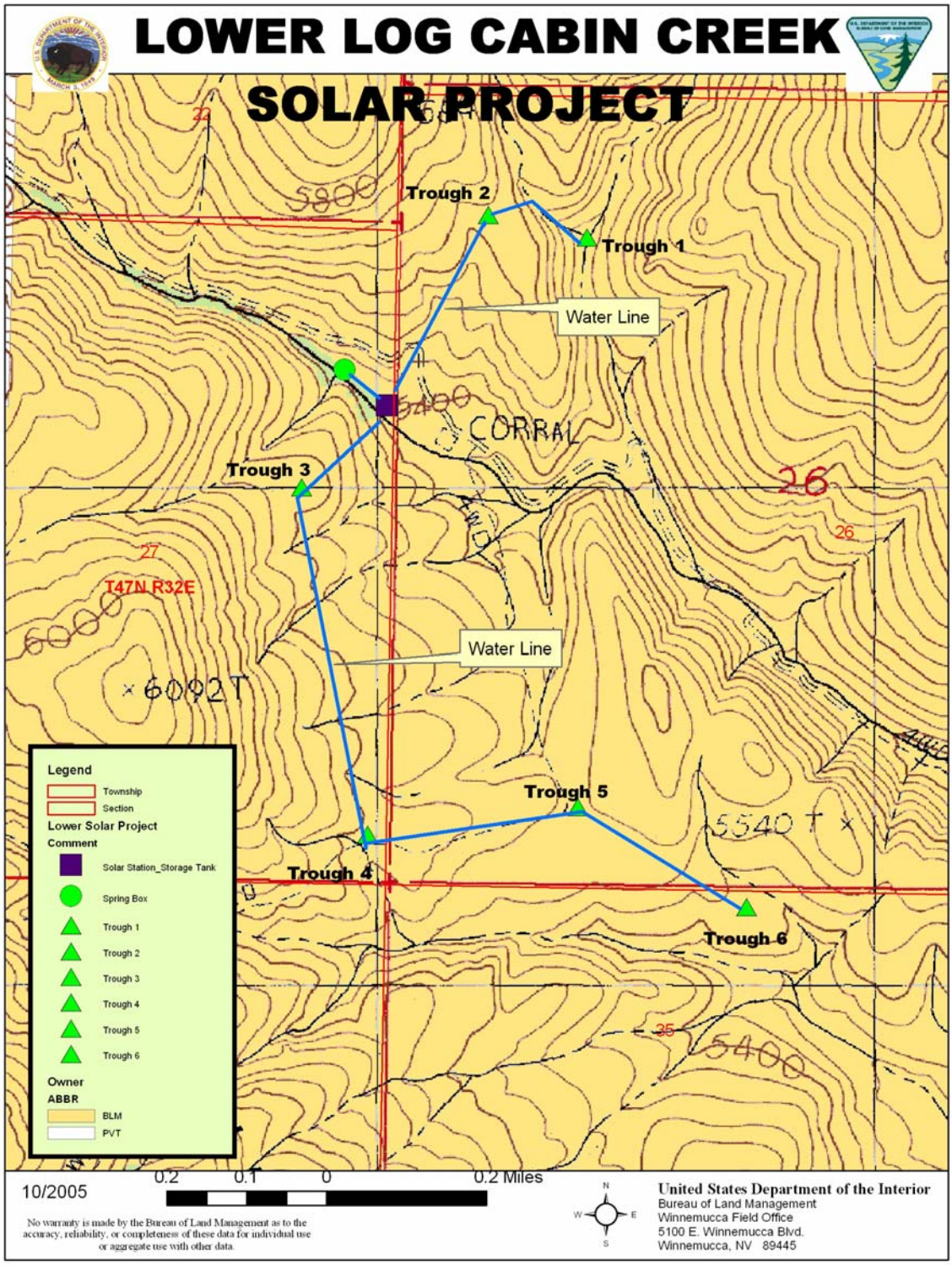
MAP #3


LOWER LOG CABIN CREEK
SOLAR PROJECT
Trough 1
Trough 2
Trough 3
Trough 4
Trough 5
Trough 6
Water Line
Water Line
CORRAL
T47N R32E
Legend
Township
Section
Lower Solar Project
Comment
Solar Station_Storage Tank
Spring Box
Trough 1
Trough 2
Trough 3
Trough 4
Trough 5
Trough 6
Owner
ABBR
BLM
PVT
10/2005
0.2 0.1 0 0.2 Miles
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.
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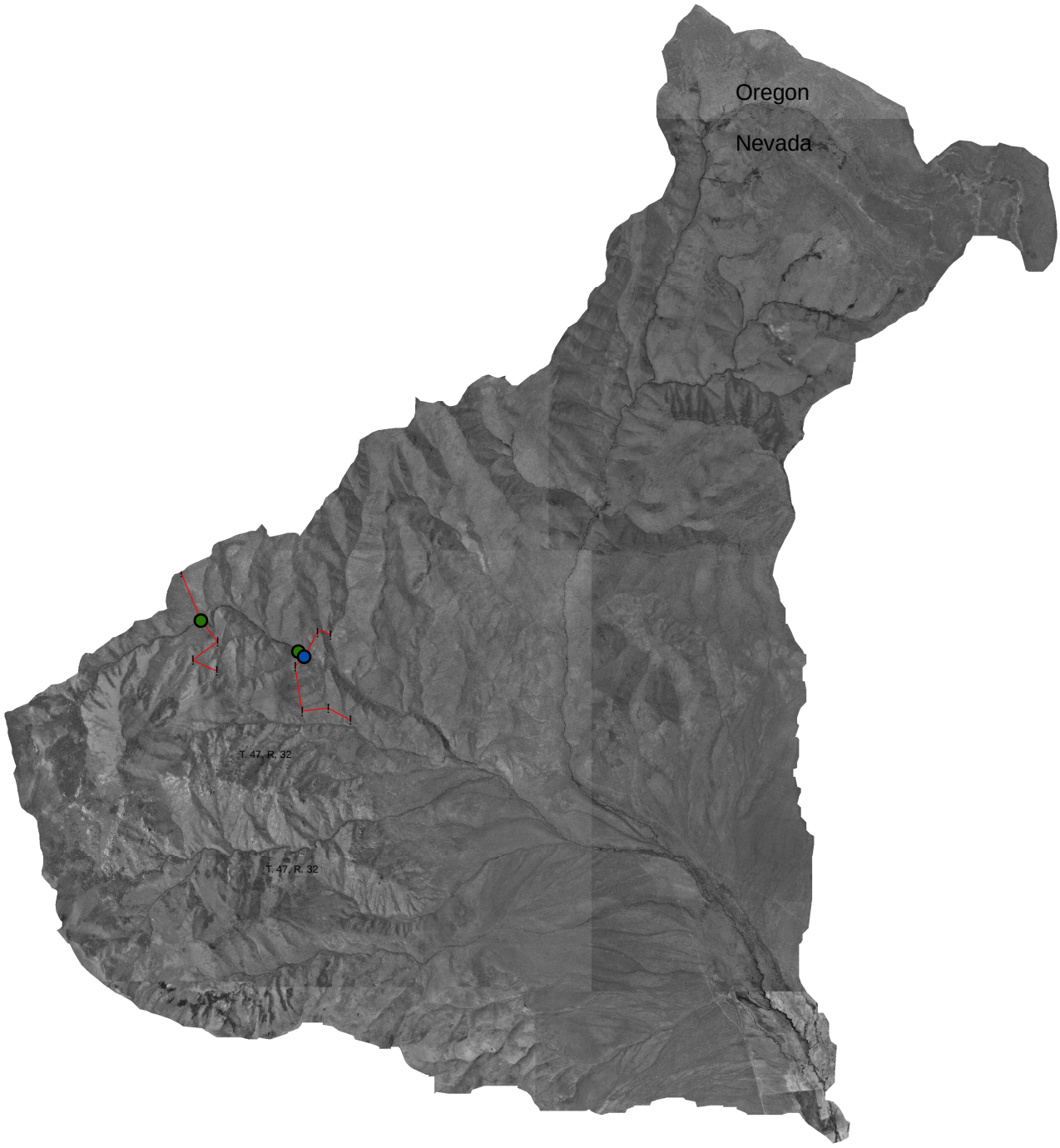
APPENDIX B

CUMULATIVE IMPACT ASSESSMENT AREA



The Cumulative Impact Assessment Area -
Log Cabin Creek Watershed

! Trough locations
Storage tank
Spring box
Water lines

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0 0.375 0.75 1.5 2.25 3
Miles